INQUIRY INTO HEAVY VEHICLE SAFETY AND USE OF TECHNOLOGY TO IMPROVE ROAD SAFETY

Organisation: J.J. Richards & Sons Pty Ltd
Name: Ms Haydee Forster
Position: National Manager Corporate Systems
Date Received: 5 February 2018
Enquiry into Heavy Vehicle Safety and Use of Technology to Improve Road Safety

Submission to the NSW Parliament
Issue Date: January 2018
Contents

1. Introduction ......................................................................................................................................................... 3
2. Fatigue/Distraction Monitoring Equipment ........................................................................................................... 3
3. Speed Limiting of Vehicles .................................................................................................................................... 3
4. Active Safety Equipment on New Vehicles ............................................................................................................. 3
  4.1 Lane Keeping Support (LKS) .......................................................................................................................... 3
  4.2 Collision Warning with Emergency Braking ....................................................................................................... 4
  4.3 Electronic Stability Packages .......................................................................................................................... 4
  4.4 Daytime Running Lights .................................................................................................................................... 4
5. j-Track / Telematics ............................................................................................................................................... 4
6. Bluetooth Enabled Vehicles .................................................................................................................................... 4
7. Load Monitoring Devices ......................................................................................................................................... 4
8. The role of compliance and enforcement in maintaining the safety of heavy vehicles on our roads ......................... 5
6. Conclusion .............................................................................................................................................................. 5
Attachment A – Guardian Seeing Machines .................................................................................................................. 6
Attachment B – Lane Keeping Support ........................................................................................................................ 16
Attachment C – Forward Collision Warning with Emergency Braking ........................................................................... 17
Attachment D – Electronic Stability Packages ........................................................................................................ 18
Attachment E – Daytime Running Lights .................................................................................................................. 19
1. Introduction

The Joint Standing Committee on Road Safety (the Staysafe Committee) is conducting an inquiry into heavy vehicle safety and the use of technology to improve road safety, and has requested input from interested parties. As a transport company with 467 units operating throughout the State of NSW, and over 2400 nationally, J.J. Richards & Sons Pty Ltd (JJR) are committed to the safety of our drivers and fleet, and are continually looking for ways to improve heavy vehicle safety.

In response to the Terms of Reference provided by the Staysafe Committee, provided in the following submission are details of some of the initiatives JJR have implemented to improve heavy vehicle safety to date, as well as some that we are currently investigating.

2. Fatigue/Distraction Monitoring Equipment

JJR are investigating the use of “Seeing Machines” for long distance operations, as we believe they will make a significant contribution towards reduction of fatigue/distraction events. These systems involve in-cab driver sensors (using face and eye tracking algorithms) and forward facing cameras to detect symptoms of fatigue and alert the affected driver, preventing an incident from occurring. This particular system also has 24/7 monitoring for increased effectiveness.

Please refer to Attachment A for further information. They also have a website: https://www.seeingmachines.com/industry-applications/fleet-guardian/

3. Speed Limiting of Vehicles

J.J. Richards was one of four finalists in the 2014 Australian Road Safety Awards under the category of Corporate Fleet Safety. Our entry in the awards was though a project resulting in the speed limiting of our entire heavy vehicle fleet to a maximum 90 kilometres per hour.

As a family owned waste management company with over 85 years in the transport industry, the safe management of our fleet of over 2,400 units is of the utmost importance.

To achieve this, we have robust training programs for our driving staff combined with strict compliance requirements and monitoring. We also have a highly skilled and dedicated team of Fleet Management professionals and workshop staff to ensure we maintain our fleet to the highest standards, which exceed those prescribed by relevant authorities and manufacturer’s specifications and guidelines.

Benefits include:
- Slower speed: shorter stopping distances required, further away from the vehicle’s dynamic limit, more time to identify and react to dangers ahead.
- Reduces the opportunity for heavy vehicles to intimidate other road users.
- Reduces fuel burn.
- Widely adopted practice in Europe, Japan, NZ and some freeways in Victoria

4. Active Safety Equipment on New Vehicles

When selecting the supplier for our next generation of heavy vehicles, one of the highest priority considerations were the safety features, as well as commitment to environmental sustainability and vehicle operational efficiency. This led JJR to select Volvo as our preferred supplier.

Outlined below are some of the safety features that we believe should be mandatory for all heavy vehicles:

4.1 Lane Keeping Support (LKS)

Lane Keeping Support alerts the driver during unintentional deviation from the driving lane. Please refer to Attachment B for further information.
4.2 Collision Warning with Emergency Braking

Heavy Vehicles are required to interact with significant volumes of traffic on a daily basis. Often other vehicles become frustrated and/or think they can “fit in” between a heavy vehicle and the vehicle in front, significantly reducing braking distances. Forward collision warning with emergency braking can assist heavy vehicle drivers in this regard, by providing an audio and visual collision warning, reducing the risk of accidents occurring.

JJR have selected Volvo as our preferred supplier as they are able to provide these warning systems in the vehicles that are offered to us.

Please refer to Attachment C for further information.

4.3 Electronic Stability Packages

Electronic Stability Packages help prevent skidding and roll over of heavy vehicles. The system allows for swift responsiveness and allows for the distribution of braking force across the vehicle’s brakes to maintain stability in difficult driving conditions.

JJR have selected Volvo as our preferred supplier as this is a standard feature in all of their models.

Please refer to Attachment D for further information.

4.4 Daytime Running Lights

The Daytime Running Light feature makes the heavy vehicle more visible which improves safety.

Please refer to Attachment E for further information.

5. j-Track / Telematics

JJR has designed and implemented an in truck computer system called j-Track® which is used to monitor and optimise collection vehicle performance and record important service information for each daily run. While such systems are available from external suppliers, we decided to invest in developing our own system so it can easily be customised to meet our changing information needs and those of the customers that we service.

The j-Track® system provides numerous benefits to the company including:

- Drivers run navigation to ensure consistent service times.
- An accurate record of compliance with driving regulations including compulsory rest breaks and legal loading (as per Chain of Responsibility requirements).
- Stream recording of all vehicles movements via a forward facing camera on the windshield of the cab and the reversing camera. The footage can be used to identify and address any dangerous practices that drivers may exhibit, including tailgating.
- Compliance with all site road rules. If there is a suspicion that road rules i.e. speed limits have been violated, the console provides the tools for J.J. Richards’ operations staff or managers to review vehicle movements and recorded speeds in detail.
- Speeding is monitored in the collection vehicle by the GPS navigation system in j-Track® and the driver receives an audible reminder if travelling over the speed limit.

6. Bluetooth Enabled Vehicles

JJR believe that all commercial vehicles be Bluetooth enabled, so that drivers are more likely to engage in compliant mobile phone use.

7. Load Monitoring Devices

A current waste industry practice is to use pressure gauges to monitor loads and reduce the possibility of overloads. This is relatively successful but not 100% fail-safe. JJR are investigating the fitting of load monitoring devices to our vehicles which will provide more accurate information to drivers and reduce the possibility of overloads.
8. The role of compliance and enforcement in maintaining the safety of heavy vehicles on our roads

Poor vehicle condition may be a function of:
- Budgetary restraints as a result of tiny margins,
- Delegation of maintenance to third parties like dealers (followed by little or no quality checking and scrutiny of the work),
- General lack of commitment, understanding and knowledge by vehicle owners.

We believe that to combat this decline requires the maintenance of a compliance and enforcement framework at a government level.

A compliance strategy could include the requirement for all companies to hold a “License” to own and operate heavy vehicles. A licence that requires them to demonstrate that they are adequately educated and understand their obligations and that if they do not comply that the licence can be revoked.

9. Conclusion

J.J. Richards is committed to maintaining the high standard of our fleet and continually investigating new opportunities, which could further improve health and safety within the heavy vehicle transport industry. We hope that the information submitted provides some areas for further investigation/discussion, and are happy to be involved in any further discussions regarding this important topic.

All initiatives outlined may not be feasible for each and every type of heavy vehicle, but where risks are identified to be high, they could prove worthwhile.
Attachment A – Guardian Seeing Machines
IMPLEMENTATION OPTIONS FOR GUARDIAN
OPTIONS | OVERVIEW

Four Options covered with varying degrees of commitment and pricing

1. Standard Purchase
2. Proof of Concept & 100+ Deployment
3. Proof of Concept & 500+ Deployment
4. Proof of Concept, Co-Development & Deployment (800+)

Current Guardian offering included in all options as a minimum (Option 4 allows for further integration & development input)

Current Guardian offering includes Licensing, 24/7 Support & 24/7 Monitoring

Seeing Machines will appoint an Operations Manager to work with Customer to ensure the final solution is suitably integrated into the business.
DEPLOYMENT OPTIONS

OPTION 1 | STANDARD PURCHASE

Hardware - $1,440 per unit

Licencing, 24/7 Monitoring & Support - $80 per month (36 month contract)

Installation - $500 per system or Customer technicians trained to complete installs ($1,500 per day for training)

DEPLOYMENT - 5+ SYSTEMS

Units installed into vehicles as requested across any sites / depots / BU’s)

Setup of new sites in Database

Develop Fatigue Intervention Plan for each site / depot / BU

Includes Licensing, 24/7 Support & 24/7 Monitoring

Change Management support per site
ASSESSMENT & DEPLOYMENT OPTIONS

OPTION 2 | PROOF OF CONCEPT & 100+ DEPLOYMENT

PHASE 1 - Contract with KPI’s
$5,000

PHASE 2 - Deploy following meeting KPI’s
$120 per unit per month (36 months) + Installation

PROOF OF CONCEPT
- 5 units installed
- 4 week duration
- 2 weeks silent alarms
- 2 weeks active phase plus 24/7 intervention
- Technician training
- Basic Change Management

DEPLOYMENT - 100+ SYSTEMS
- 100+ units installed (multiple sites / depots / BU’s)
- Project Plan developed and delivered prior to implementation
- Develop Fatigue Intervention Plan for each site / depot / BU
- Includes Licensing, 24/7 Support & 24/7 Monitoring
- Technician training options by site
- Change Management Training per site

GUARDIAN
PREVENT. PROTECT.

seeingmachines
**OPTION 3 | PROOF OF CONCEPT & 500+ DEPLOYMENT**

**PHASE 1 - Contract with KPI’s**

- $5,000

**PHASE 2 - Deployment following meeting KPI’s**

- $99 per unit per month (36 months) + Installation

---

**PROOF OF CONCEPT**

- 5 units installed
- 4 week duration
- 2 weeks silent alarms
- 2 weeks active phase plus 24/7 intervention
- Technician training
- Basic Change Management

**DEPLOYMENT - 500+ SYSTEMS**

- 500+ units installed (multiple sites / depots / BU’s)
- Project Plan developed and delivered prior to implementation
- Develop Fatigue Intervention Plan for each site / depot / BU
- Includes Licensing, 24/7 Support & 24/7 Monitoring
- Technician training options by site
- Change Management Training per site
ASSESSMENT & DEPLOYMENT OPTIONS

**OPTION 4 | PROOF OF CONCEPT, CO-DEVELOPMENT & DEPLOYMENT (800+)**

**PHASE 1** - No Contract

- 5 units installed
- 4 week duration
- 2 weeks silent alarms
- 2 weeks active phase plus 24/7 intervention
- Technician training
- Basic Change Management
- **$5,000**

**PHASE 2** - Contract with staged payments to meet gateways & KPI’s

- 80 units installed for immediate Assessment (with standard delivery items)
- Requirements defined for Product & Integration
- Integration with preferred telematics & other Customer business systems
- Includes Licensing, 24/7 Support & 24/7 Monitoring
- Define Project Gateways with Exit Clauses
- **$72 per truck per month over 36 months**

**INTEGRATION**

**DEPLOYMENT - 720 SYSTEMS**
Payment staged to align with project gateways

Exit clauses available at each gateway based on KPI’s

Final delivered system will be custom designed, fully integrated Customer specific solution
## Seeing Machines Guardian - Features Listing

<table>
<thead>
<tr>
<th><strong>Hardware</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>Processing algorithms, relaying data, storing Black Box footage</td>
</tr>
<tr>
<td>Infrared Pods</td>
<td>Illuminating cab to allow night vision and ability to see through dark glasses</td>
</tr>
<tr>
<td>Camera</td>
<td>Camera tracks face, built in test button to include system test into pre-start check, LED light to indicate errors. Built in buzzer to alert driver when event occurs</td>
</tr>
<tr>
<td>GPS, WiFi &amp; 3G Antenna</td>
<td>Enable connectivity, GPS tracking, event location, GPS used to track vehicle speed, connect via WiFi or 3G</td>
</tr>
<tr>
<td>Vibration Alert Motor</td>
<td>Vibration alert is connected to seat to alert driver once an event is triggered. Configurable by event type.</td>
</tr>
<tr>
<td>Forward Facing Camera</td>
<td>Onboard accelerometer to trigger events. Captures road view footage and sends to Computer via WiFi. Configurable which footage to be sent according to event type.</td>
</tr>
</tbody>
</table>

### Triggered Event Types

- **Eye Closure**: Eye closure events trigger when the eyes close for a period of 1.5 seconds+ while the vehicle is traveling faster than 5kmh.
- **Head Rotation**: Head rotation captures attention off road events. If the operator looks outside of a defined field of view for a x seconds over x speed and event is triggered.
- **Accellerometer**: G-Force thresholds are triggered on the x, y and z axis to trigger multiple event types.

### Event Classification

- **Eye Closure**: Microsleep, Drowsy, Controlled Eye Closure, Praying, Sneezing, Yawning, singing
- **Head Rotation**: Distraction event, glance away, glance down
- **Accellerometer**: Heavy Breaking, Harsh Cornering, Vehicle Impact
- **GPS Based Events**: Overspeed set up using maximum speed threshold
- **Other**: Other behaviour seen in any event type can be added to classification. Smoking, Mobile Phone Use, Reading, No Seatbelt (limited by field of view)
- **Custom**: Potential to add customisable event types to be classified if behaviour is seen in footage - non standard
- **Web Interface**: Can be viewed on computer or smartphone. Locked down by username / site specific / role specific credentials
<table>
<thead>
<tr>
<th>Seeing Machines Guardian - Features Listing (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Off Site Infrastructure &amp; Services</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Web Interface</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Black Box</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Attachment B – Lane Keeping Support

The Lane Keeping Support system (LKS) is a drive support system with the task to alert the driver during unintentional deviation from the driving lane.

The system alerts where unintentional deviations from the lane can result in accidents. The system uses a camera positioned in the upper centre area of the windscreen to alert the driver with an acoustic signal from the speakers.

The LSS-DW shall warn at the latest when the outside of the tire of the vehicle’s front wheel (closest to the lane markings) crosses a line 0.3 m beyond the outside edge of the visible lane marking to which the vehicle is being drifted (see picture).

The system operates in speeds from 60 km/h and can be activated/deactivated with a switch in the dashboard.
Attachment C – Forward Collision Warning with Emergency Braking

Forward collision warning with emergency braking - HWSS-FCB
The HWSS-FCB variant includes forward collision warning. The system alerts the driver at the risk of a collision with the vehicle ahead. If risk of collision is imminent the vehicle brakes will be applied automatically. The warning consists of a full tale in the instrument cluster that will be lit and an acoustic signal from the instrument cluster.

HWSS-FCB uses both the radar and a camera to collect information. The function is activated each time the vehicle is started and is available at speeds above 15 km/h.

FEATURES AND BENEFITS
- Reduces risk of accidents and collisions.
- Audio and visual collision warning.
- Fulfills UN/ECE requirements.


Electronic Stability Programme Package

Electronic Stability Programme Package, ESP-BAS1, is one of the most important safety features and is standard for all truck specifications. The programme helps preventing skidding and rolling over.

ESP provides more stable braking while making it possible to distribute the braking force individually between the truck's wheel brakes and the service brakes on the trailer. The system is extremely fast-acting. The control unit continuously receives information from a wide variety of yaw rate sensors and makes a new evaluation of the driving situation several times per second. If the system detects that the truck is starting to lurch or behave abnormally in some other way, the ESP activates the brakes individually in order to straighten up the vehicle combination.

ESP brakes each wheel individually

In practice, ESP-BAS1 reduces engine torque and controls the truck's wheel brakes individually. The yaw control function helps maintaining direction stability in difficult driving conditions. The system also brakes the trailer, thereby providing stability for the entire vehicle combination and counteracting jack-knifing, rollover and trailer swing.

FEATURES AND BENEFITS

- ESP minimises the risk of skidding and rolling over.
- ESP brakes each wheel on the truck individually.
- Increased traffic safety.
FACT SHEET
Day running light   DRL/LED

Y-shaped ("Y-light") day running light (LED):
The Daytime Running Light is combined with the front position light using LED technology. When activated, the DRL has a distinct Y-shape.

Two different options for DRL functions are available:
- UDRL (Daytime Running Light unactivated)
- DRL LED (Daytime Running Light activated)

The variant DRL LED is available on Volvo FL, equipped with Euro 4 or Euro 5 engine and on Volvo PC with Euro 3, Euro 4 or Euro 5 engine.

The DRL LED has functions as follows:
- When the engine is started, the DRL is functioning in full power.
- The light switch must be in position "Y", the means on front and rear lights.
- If the dipped or main beam is activated, the DRL is dimmed.

FEATURES AND BENEFITS
• Powerful LED light, makes the truck more visible, which increases safety.
• Distinct Volvo Y-shape building the brand.
• Energy efficient LED light saves power.